

What is Claimed:

1. A system for positioning a load, said load coupled to a cable, said
2 system comprising:

3 a column which defines a first vertical axis;

4 an arm unit which supports said load and which moves along said first
5 vertical axis;

6 a rotation unit for rotating said first vertical axis about a second vertical
7 axis spaced apart from the first vertical axis;

8 said column positionable so that it is closer to said load than said second
9 vertical axis is to said load;

10 said load positionable by said arm unit so that said cable intersects said
11 second vertical axis and said cable is situated to a side of said column.

12 2. A system according to claim 1, wherein said load has a center of
13 gravity and wherein said center of gravity, said first axis and said second axis are situated
14 at the respective vertices of a triangle.

15 3. A system according to claim 1, wherein said column is forward of
16 said second vertical axis towards said load and to a side of said second vertical axis.

17 4. A system for positioning a load according to claim 1, further
18 comprising a cable support which supports a cable coupled to the load.

19 5. A system for positioning a load according to claim 4, wherein said
20 cable support moves along a third vertical axis.

21 6. A system for positioning a load according to claim 1, wherein said
22 rotation unit includes a bottom plate, and a swing plate which is coupled to said arm unit
23 and which rotates relative to said bottom plate about said second vertical axis in order to
24 rotate said load about said second vertical axis.

25 7. A system for positioning a load according to claim 1, wherein said
26 rotation unit includes a side to side plate which moves said load horizontally along a first
27 horizontal axis orthogonal to said first vertical axis.

*Replaced by
2nd unit.
3rd unit.*

8. A system for positioning a load according to claim 1, wherein said rotation unit includes an in-out plate which moves said load horizontally along a second horizontal axis which intersects said first horizontal axis and which is orthogonal to said first vertical axis. *fig. 13*

9. A system for positioning a load according to claim 4, wherein said cables exit a test cabinet before being received for support by said cable support, and wherein said load is an electronic test head.

10. A system for positioning a load according to claim 6, wherein said rotation unit includes a plurality of indexing members for indexing rotation of said swing plate about said second vertical axis.

11. A system for positioning a load according to claim 4, wherein said cable support telescopes.

12. A system for positioning a load, said load coupled to a cable, said system comprising:

3 712 738
a column which defines a first vertical axis;

4 708
a cable support which moves along a third vertical axis and which supports
5 a cable coupled to said load; and

6 736
7 an arm unit which moves along said first vertical axis and which supports
said load;

8 said column positionable so that it is closer to said load than said second
9 vertical axis is to said load;

C A B

10 said load positionable by said arm unit so that said cable intersects said
11 second vertical axis and said cable is situated to a side of said column.

12. A system for positioning a load according to claim 11, further
13 comprising a rotation unit for rotating said first vertical axis about a second vertical axis
14 spaced apart from the first vertical axis.

1 14. A system for positioning a load according to claim 11, wherein said
2 cable support moves along said third vertical axis at one end thereof and said cable
3 extends away from said one end and towards said load.

1 15. A system for positioning a load according to claim 13, further
2 comprising a base to which said arm unit is coupled, said base including a bottom plate,
3 and a swing plate which is coupled to said arm unit and which rotates relative to said
4 bottom plate about said first vertical axis in order to rotate said test head about said first
5 vertical axis.

1 16. A system for positioning a load according to claim 13, wherein said
2 base includes a side to side plate which moves said test head horizontally along a first
3 horizontal axis orthogonal to said first vertical axis.

1 17. A system for positioning a load according to claim 13, wherein said
2 base includes an in-out plate which moves said test head horizontally along a second
3 horizontal axis which intersects said first horizontal axis and which is orthogonal to said
4 first vertical axis.

1 18. A system for positioning a load according to claim 11, wherein said
2 cables exit a test cabinet before being received for support by said support unit, and
3 wherein said load is an electronic test head.

1 19. A system for positioning a load according to claim 15, wherein said
2 base includes a plurality of indexing members for indexing rotation of said swing plate
3 about said first vertical axis.

1 20. A system for positioning a load according to claim 11, wherein said
2 cable support telescopes.

1 21. A system for positioning a load, comprising:
2 an arm unit which supports said load and which moves along a vertical
3 column which defines a first vertical axis,
4 a rotation member for rotating said first vertical axis about a second
5 vertical axis spaced apart from said first vertical axis; and

6 a cable support which moves along a third vertical axis and which supports
7 a cable coupled to said load.

1 22. A system for positioning a load according to claim 21, wherein said
2 arm unit moves upward and downward along said column.

1 23. A system for positioning a load according to claim 21, wherein said
2 cable support moves along said third vertical axis at one end thereof and said cable
3 extends away from said one end and towards said load.

1 24. A system for positioning a load according to claim 21, wherein said
2 rotation unit includes a bottom plate, and a swing plate which is coupled to said arm unit
3 and which rotates relative to said bottom plate about said second vertical axis in order to
4 rotate said load about said second vertical axis.

1 25. A system for positioning a load according to claim 21, wherein said
2 rotation unit includes a side to side plate which moves said load horizontally along a first
3 horizontal axis orthogonal to said first vertical axis.

1 26. A system for positioning a load according to claim 21, wherein said
2 rotation unit includes an in-out plate which moves said load horizontally along a second
3 horizontal axis which intersects said first horizontal axis and which is orthogonal to said
4 first vertical axis.

1 27. A system for positioning a load according to claim 23, wherein said
2 cables exit a test cabinet before being received for support by said cable support, and
3 wherein said load is an electronic test head.

1 28. A system for positioning a load according to claim 25, wherein said
2 rotation unit includes a plurality of indexing members for indexing rotation of said swing
3 plate about said second vertical axis.

1 29. A system for positioning a load according to claim 21, wherein said
2 cable support telescopes.

1 30. A positioner for moving a test head into docking position with a
2 device handler, said positioner comprising:

3 an arm unit portion for moving said test head along or about at least one
4 axis; and

5 a motor drive having a driving portion for selectively driving said arm unit
6 portion so that said test head moves along or about said at least one axis, said driving
7 portion physically movable to disengage said driving portion so that rotation of said
8 driving portion does not effect movement of said arm unit portion along or about said at
9 least one axis.

1 31. A system for positioning a load, comprising:

2 an arm unit for moving said load along or about at least one axis;

3 a motor drive having a driving portion for selectively driving said arm unit
4 portion so that said load moves along or about said at least one axis, said driving portion
5 physically disengageable so that free motion of said load along or about said axis is
6 possible when said motor drive is not in use.

7 32. A system for positioning a load according to claim 31, wherein said
motor drive provides constant torque when moving said load.

8 33. A system for positioning a load according to claim 32, wherein said
constant torque is controlled to a value sufficient to move said load.

9 34. A system for positioning a load according to claim 31, wherein said
motor drive comprises an electric motor, a reduction gear train, and an electromagnetic
clutch coupled to the movable portion of the system via a pulley and belt.

1 35. A system according to claim 34, wherein said clutch is a torque
limiting slip clutch.

2 36. A system according to claim 33, wherein said motor is a dc motor,
and said constant torque is controlled by controlling the current supplied to said dc motor.

3 37. A system for positioning a load according to claim 31, wherein said
motor drive comprises an electric motor, a reduction gear train, and an electromagnetic
clutch coupled to the movable portion of the system via a friction drive roller.

38. A system for positioning a load according to claim 31, wherein said free motion occurs along said at least one axis which is a vertical axis.

39. A system for positioning a load according to claim 31, wherein said free motion occurs along said at least one axis which is a horizontal axis

40. A safety lock system for preventing unlocking of a balanced loaded unit which includes a load mounted on and locked to a vertical guide rail when said loaded unit becomes unbalanced, said safety lock system comprising:

a plurality of calipers situated on opposite sides of said guide rail for simultaneously applying pressure on opposite sides of said rail:

a lock block for coupling said load to at least one of said calipers for movement of said load along said guide rail;

a rotatable handle coupled to said calipers by means of a shaft for increasing pressure by said calipers of said guide rail upon rotation of said handle in one direction in order to lock said lock block against vertical movement along said shaft and for decreasing pressure by said calipers of said guide rail from said guide rail upon rotation of said handle in an opposite direction; and

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a safety lock coupled to said loaded unit and moveable with said loaded unit for preventing rotation of said handle upon a preselected movement of said loaded unit relative to said lock block.

41. A safety lock system according to claim 40, wherein a first axis extends from said guide rail to said load; and

said shaft is orthogonal to said first axis and said guide rail.

42. A safety lock system according to claim 4, wherein said calipers exerts pressure against said rail without completely surrounding said rail

43. A system for positioning a load, said load coupled to a cable, said system comprising:

a column which defines a first vertical axis:

4 an arm unit which supports said load and which moves along said first
5 vertical axis;

6 a rotation unit for rotating said first vertical axis about a second vertical
7 axis spaced apart from the first vertical axis;

8 said second vertical axis situated not more than three widths of said cable
9 away from said test cabinet;

10 said load positionable by said arm unit so that said cable intersects said
11 second vertical axis and said cable is situated to a side of said column.

1 44. A system for positioning a load, said load coupled to a cable, said
2 system comprising:

3 a column which defines a first vertical axis;

4 an arm unit which supports said load and which moves along said first
5 vertical axis;

6 a rotation unit for rotating said first vertical axis about a second vertical
7 axis spaced apart from the first vertical axis;

8 said cable situated along an axis which intersects a center of gravity of said
9 load;

10 said load positionable by said arm unit so that said cable intersects said
11 second vertical axis and said cable is situated to a side of said column.